What is claimed is:

1. An arrangement for dispensing and observing the luminescence of individual specimens in multi-specimen arrangements, particularly for the examination of biological, chemical or cytobiological assays with high specimen throughput comprising:

a microplate with a plurality of wells arranged in rows and columns;

a dispensing unit with a fixed quantity of dispensing tips which is arranged over the microplate;

a table system for moving the microplate relative to the dispensing unit;

an optical system by which luminescent light that is excited in the wells of the microplate due to the dispensing is transferred to a CCD camera;

said optical system and CCD camera being arranged below the microplate;

said above-mentioned components being located in a light-tight housing;

said dispensing unit having at least one linear dispensing comb having a symmetric treelike structure;

said dispensing comb containing an even number of dispensing nozzles representing an integral divisor of the number of wells along one dimension of the microplate;

said dispensing combs being arranged so as to be displaceable orthogonal to their longitudinal dimension in order to dispense successively in a preselected area of the microplate;

every dispensing comb being connected to a controllable pump for metering the amount of liquid to be dispensed without immersion in wells of the microplate;

said CCD camera being oriented by the optical system to a large-area rectangular region of the underside of the microplate across from the dispensing unit, the surface in one dimension being adapted to the longitudinal dimension of the

dispensing comb and in the other dimension to the area of the microplate covered by the displacement of the dispensing comb, so that the elapsed time for the luminescence is measurable simultaneous with the ongoing dispensing in each of the columns of wells of the microplate in which dispensing is carried out successively.

2. The arrangement according to claim 1, wherein the quantity of nozzles of a dispensing comb corresponds to the quantity of wells in the columns of the microplate, so that the comb is displaced continuously exclusively orthogonal to its longitudinal dimension.

3. The arrangement according to claim 1, wherein the quantity of nozzles of the dispensing comb is less than the quantity of wells of the columns of the microplate, wherein the quantity of wells in the columns of the microplate is an integral multiple of the quantity of dispensing nozzles of the comb, and after the column-wise displacement of the dispensing comb in x-direction the microplate is displaceable in y-direction by a number of row spaces equal to the quantity of nozzles of the dispensing comb in order to repeat the displacement of the dispensing comb in x-direction.

4. The arrangement according to claim 1, wherein the dispensing unit has a plurality of dispensing combs which are arranged parallel to one another, rigidly coupled with one another and displaceable over the surface of the microplate observed by the CCD camera.

5. The arrangement according to claim 4, wherein the dispensing combs are provided for successively dispensing different substances in the same wells of the microplate.

6. The arrangement according to claim 5, wherein the dispensing unit has, in addition, a controllable valve for each dispensing comb for switching

between different dispensing substances, and the valves are arranged in front of the pump of every comb.

7. The arrangement according to claim 6, wherein a waste trough is provided next to the microplate in the displacement area of the dispensing comb for taking the dispensing substance, the waste trough being oriented parallel to the longitudinal dimension of the comb in order to expel the previously used dispensing substance still remaining in the comb, pump and connection tubes up to the valve in that it is displaced by a new substance.

8. The arrangement according to claim 4, wherein the dispensing combs are provided for successively dispensing the same substance in different wells of the microplate.

9. The arrangement according to claim 3, wherein the nozzles of a dispensing comb have twice the distance of the wells of the microplate, wherein dispensing is carried out only in the odd-numbered wells of the columns of the microplate in a first step and dispensing is carried out only in the even-numbered wells of the columns of the microplate in a second step.

10. The arrangement according to claim 9, wherein two dispensing combs are arranged so as to be offset parallel to one another by half of the distance between the nozzles.

11. The arrangement according to claim 9, wherein a dispensing comb is displaceable along its longitudinal dimension relative to the microplate by half of the distance between the nozzles of the comb.

12. The arrangement according to claim 11, wherein the relative displacement of the dispensing comb by half of the nozzle distance is provided by

displacing the microplate in the y-direction between two different positions by the table system.

13. The arrangement according to claim 11, wherein the relative displacement of the dispensing comb by half of the nozzle distance is provided by displacing the dispensing unit in y-direction between two different positions.

14. The arrangement according to claim 1, wherein the optical system of the CCD camera has a fast objective, an electron-optical light intensifier, and reducing relay optics.

15. The arrangement according to claim 14, wherein the chip of the CCD camera is cooled.

16. The arrangement according to claim 14, wherein a commercial objective which images the microplate completely on the chip of the CCD camera is provided as the fast objective of the optical system.

17. The arrangement according to claim 14, wherein a telecentric objective with a high numerical aperture is provided as the fast objective of the optical system by which a rectangular portion of the microplate can be imaged on the chip of the CCD camera, wherein the dispensing unit is arranged above the visual field of the CCD camera that is defined in this way and its displacing area is adapted to the available visual field of the CCD camera.

18. The arrangement according to claim 17, wherein the microplate is divided into eight rectangular portions of equal size which can be introduced one after the other into the visual field of the CCD camera continuously and without overlapping by the table system, wherein the longer edge of the chip of the CCD camera is oriented in the direction of the short side of the microplate in

order to compensate extensively for the side ratios of the chip and microplate and in order to make use of the whole visual field of the CCD camera.

19. The arrangement according to claim 1, wherein in order to adapt to different types of microplates an adapter holder is provided for fastening microplate holders to the table system in order to ensure a constant height of the upper surface of the microplate in case of different thicknesses of the microplates.

20. The arrangement according to claim 19, wherein an adjusting unit is provided for vertical displacement of the entire optics camera block in order to adjust sharp imaging on the chip of the CCD camera.

21. The arrangement according to claim 19, wherein an additional autofocusing unit is provided for adjusting sharp imaging on the chip of the CCD camera.

22. The arrangement according to claim 19, wherein an alignment unit is provided, equipped with two dim light emitting diodes, focusing lenses, battery and power switch, those diodes separated alike the nozzle pitch of the comb by a multiple of the well's pitch, the unit fitting exactly into the holder of the dispensing comb and which is used to perform alignment between light spots and mechanical position of MP 2 by observing the light spots with the camera and stepping the MP 2 in x/y direction.